Developing Climate Scenarios for the Energy Sector at UCLA

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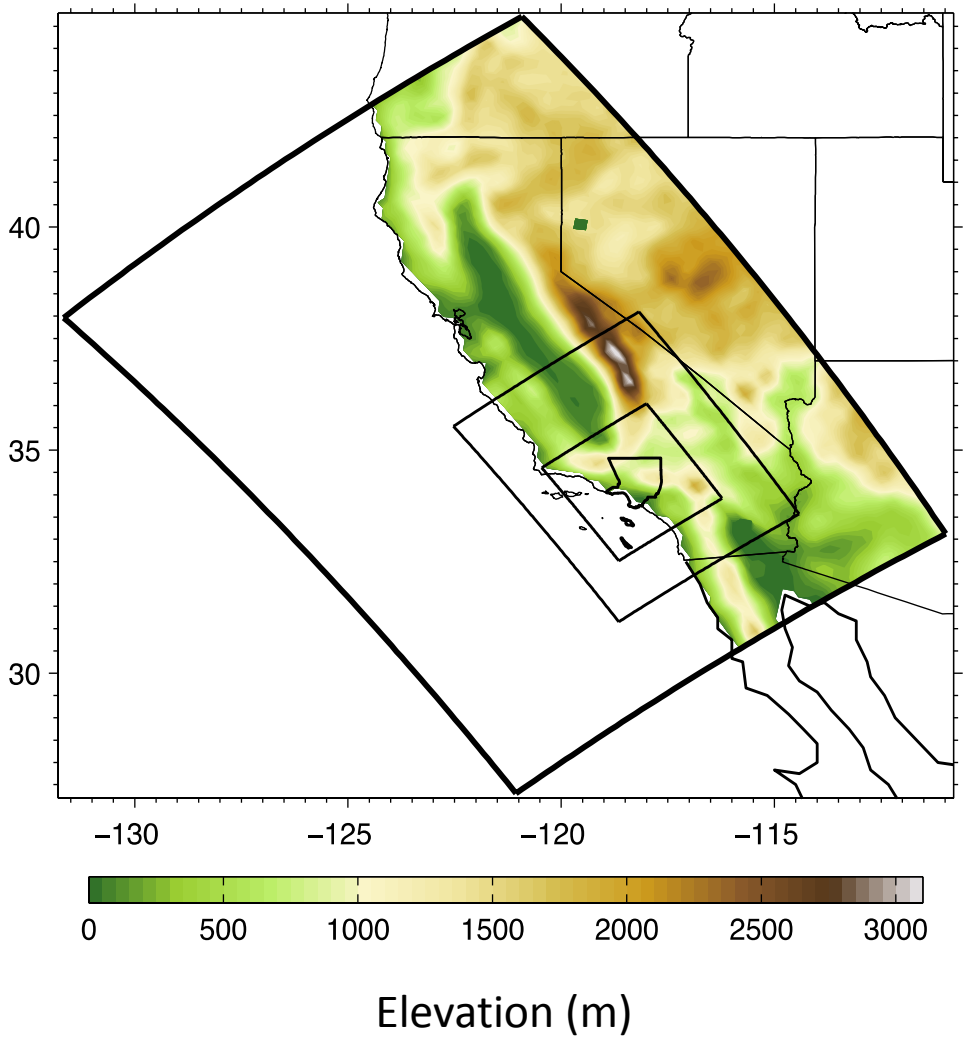
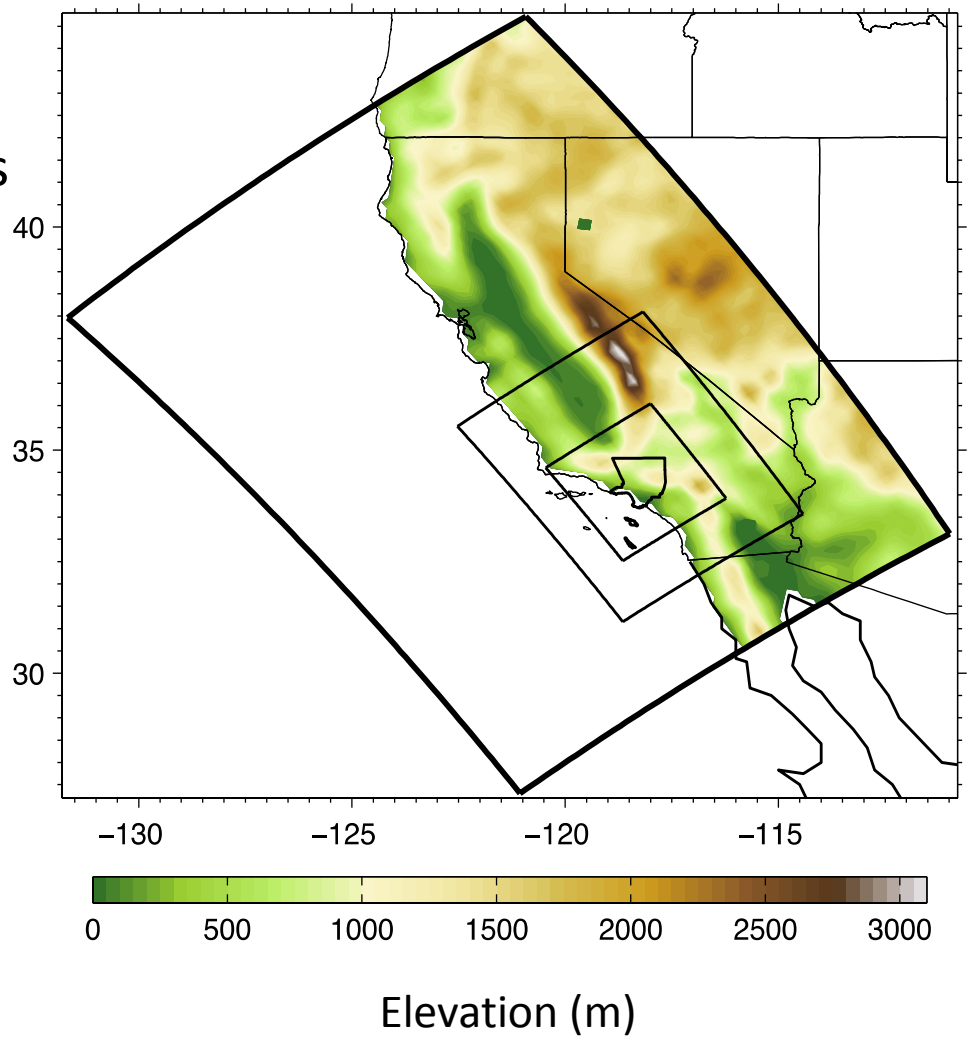
Climate Change in the LA Region Project

- Dynamical downscaling over California (18 km), with highest resolution over the Los Angeles region (2 km).
- Dynamical downscaling produces 3D atmospheric wind, cloud, humidity, and temperature fields, as well as all surface variables (precipitation, evaporation, etc.).
- Baseline (1981–2000) simulation using WRF forced with NARR
- Future (2041–2060) dynamical downscaling runs using 5 CMIP5 GCMs under RCP 8.5



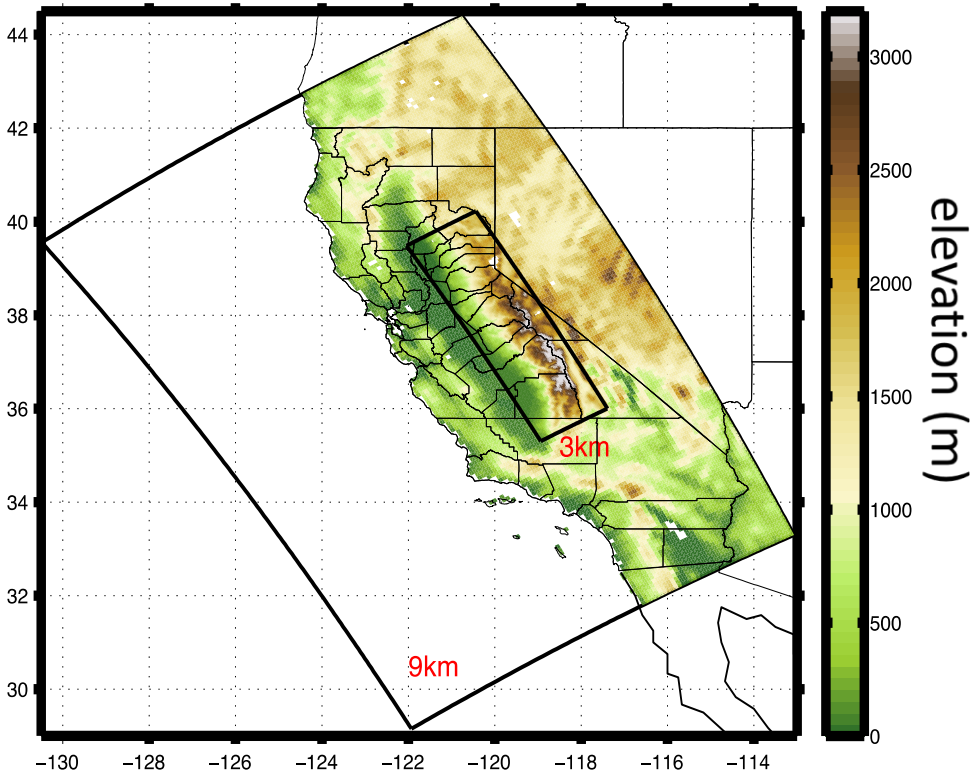
Climate Change in the LA Region Project

- Statistical downscaling undertaken to represent the full CMIP5 ensemble for key variables in the LA region (temperature, precipitation, snow)
- Completed analysis includes temperature, precipitation, snow, and runoff for the LA region.
- Collaboration with fire ecologists to produce mid-century LA regional fire projections

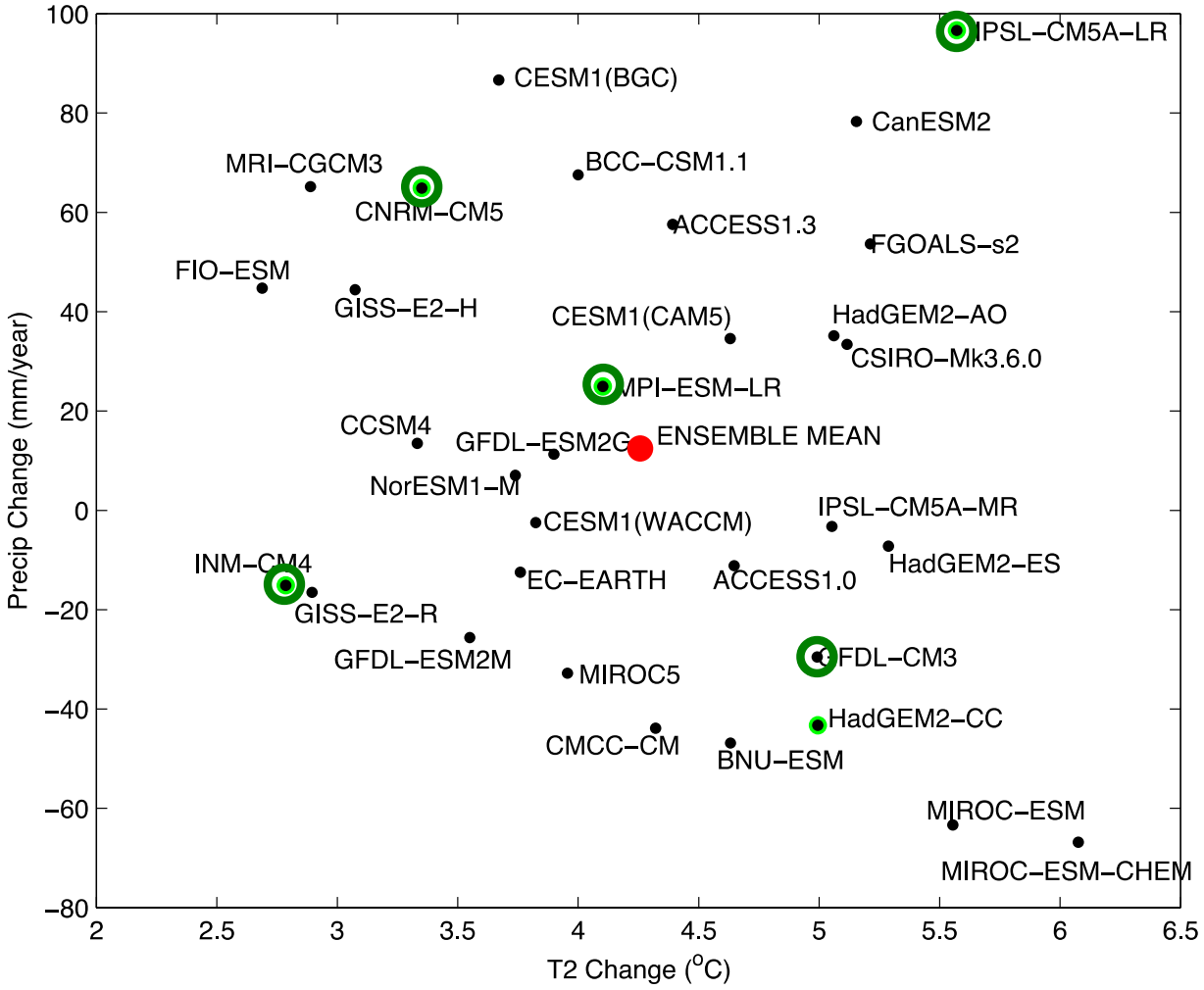


Climate Change in California Project

- Dynamical downscaling over California at 9-km resolution, with 3-km resolution over the Sierra Nevada
- Baseline (1991–2014) simulation using WRF forced with NARR
- Future (2081–2100) dynamical downscaling runs using 5 CMIP5 GCMs under RCP 8.5



GCM projections of precipitation change vs. temperature change in California

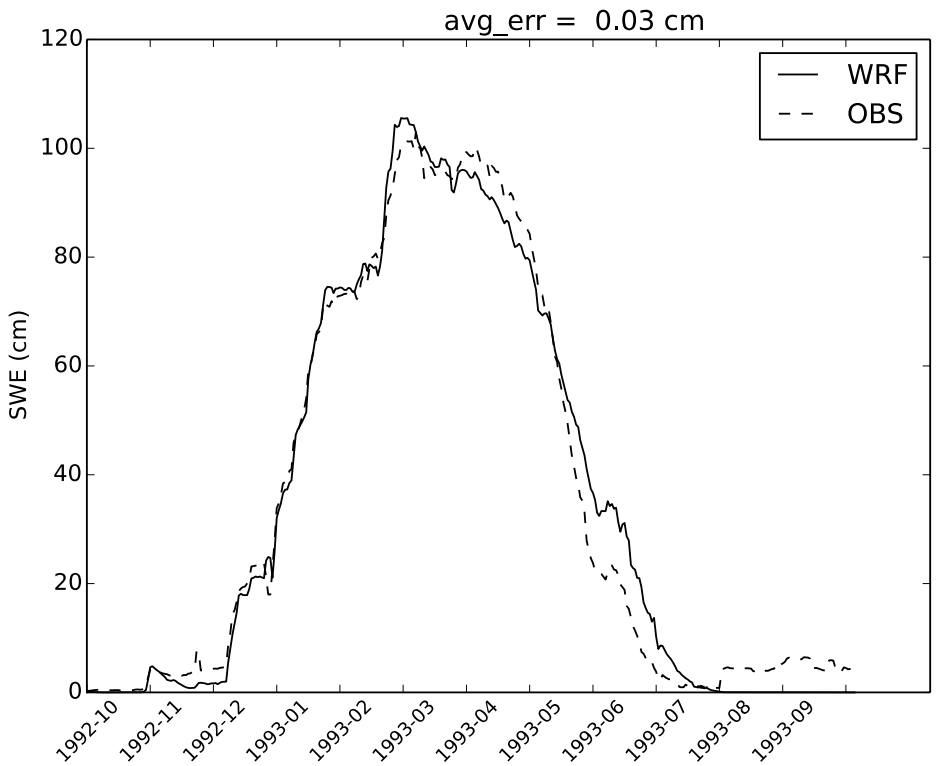


Here is how the GCMs downscaled are distributed in ΔT, ΔP space

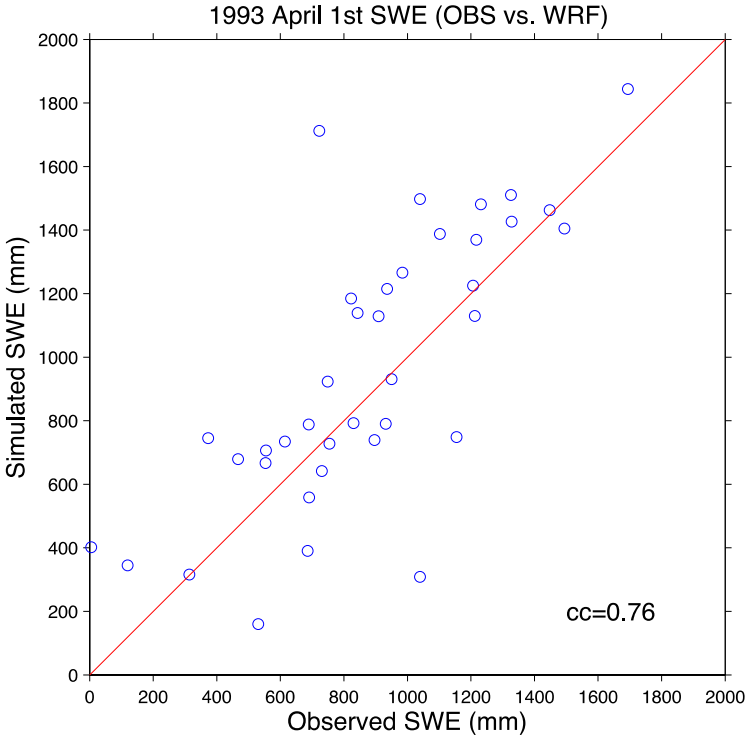
Model Evaluation, Baseline Simulation

Snow Water Equivalent in the Sierras

Temporal variability



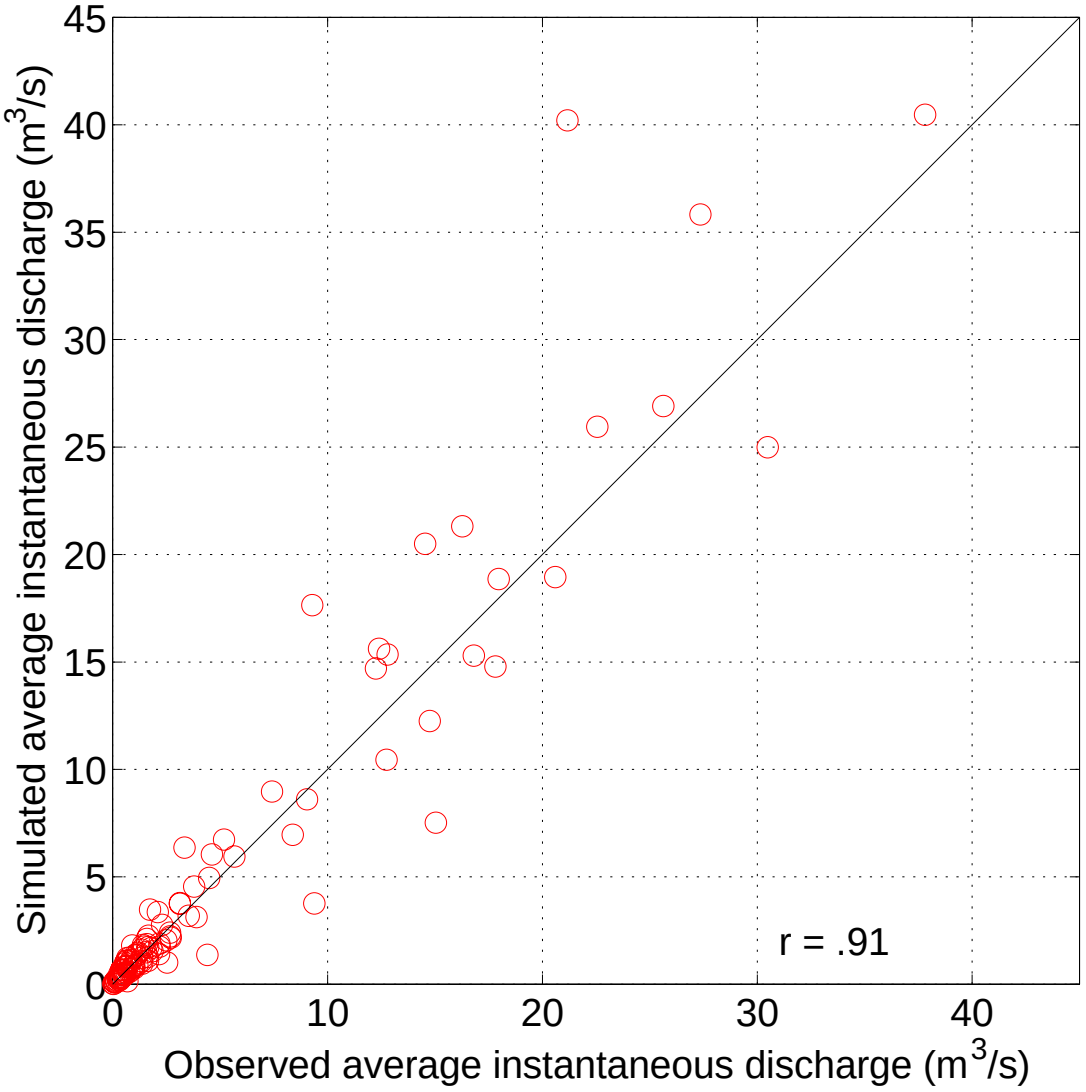
Spatial variability



Model Evaluation, Baseline Simulation

streamflow

Annual average instantaneous discharge, observed and simulated
(13 streamflow gauges x 9 water years = 117 data points)



Climate Change in California Project

- Plans include analysis for key variables such as temperature (CA), precipitation (CA), and snowpack (Sierras).
- Comparison across downscaling methods for key variables would be highly desirable.
- Analysis of runoff, winds, and cloud would be highly desirable.